4.0 ENVIRONMENTAL CONSEQUENCES FOR COMPARATIVE ANALYSIS (*NEPA Required)

An evaluation of the impacts associated with the no action alternative (Alternative 1) was presented in Chapter 2. This chapter describes the direct, indirect, and cumulative environmental consequences of implementing 3 alternatives beyond the no action. The discussion of resources in this chapter coincides chronologically with Chapter 2. Several data gaps are present in the current evaluation (a 2D hydraulic model, a 3D hydraulic model, and half a dataset from Clean Water Act contaminant sampling within the crossings). These outstanding data will be shared with the resource agencies, as well as the public upon request. All data will be thoroughly evaluated prior to signing of the Record of Decision.

As detailed in Chapter 3, after completion of the draft report, public comment, and consideration of all remaining data, final feasibility level designs will be developed for the TSP if it becomes the Recommended Plan. In order to conduct a comparative analysis of the final alternative array, alternatives were "brought up" to a similar level of detail using assumptions derived from data collected during development of the TSP. Estimates developed from that analysis provide the basis for comparing potential impacts to significant resources from the alternatives in the Final Alternative Array to potential impacts from the No Action Alternative.

The direct project-related impacts would occur within the navigation channel of the Mississippi River, in designated beneficial use disposal areas, and proposed beneficial use disposal areas adjacent to the river South of Venice, LA. As such, for the purposes of environmental discussion and analysis, the scope of the potentially affected environment has been defined as the Mississippi River corridor between Baton Rouge and the Gulf of Mexico via Southwest Pass, and the surrounding coastal habitat in lower Plaquemines Parish, LA where dredged material would be used beneficially within the limits of the Federal Standard. Alternatives were compared by total NED cost and benefits; however, consideration of the following factors were also used for the evaluation and comparison of alternative plans in light of the important resources discussed in this Chapter.

- Constructing the sill and other saltwater mitigation measures for salt water intrusion impact
- Potential loss of sediment resources for other purposes
- Construction for each depth
- Dredge quantities

- Acres of beneficial use from initial construction (*incidental benefits)*
- Long term O&M for each depth
- Annual O&M dredge quantities
- Location of shoaling
- Acres of beneficial use from long term O&M dredged material placement within the Federal Standard (*incidental benefits)*
- Due to unpredictable river conditions and navigational needs, an assumption of uniform placement of dredge material was carried forward with the environmental analysis.

4.1 Description of Alternatives

The direct, indirect and cumulative impacts of Alternative 2, Alternative 3 and Alternative 3d, are evaluated in this chapter in order of the combined total of construction cubic yardage and average annual maintenance cubic yardage (i.e., impacts of Alternative 3 > Alternative 2, > 3d, Table 4-1). It should be noted that changes in advanced maintenance (+2 ft) and allowable over depth (+2ft) are not proposed under Alternative 2.

The TSP (Alternative 3d) resulted from the optimization of Alternative 3. Alternative 3d did not increase the overall environmental footprint to the degree identified under Alternative 3 because work in the lower river was the same as in Alternative 3, and because the number of crossings dredged decreased from 12 to 3 (Fairview, Belmont, Rich Bend). As such, the level of detail in the following discussion of impacts associated with Alternative 3d will be less than that detailed for Alternative 3, as many of the impacts identified with Alternative 3d will be similar to but less than those identified for Alternative 3. For this reason, many of the impacts discussions for Alternative 3d reference the impacts disclosed under Alternative 3. This chapter presents an evaluation of Alternatives 2, 3, and 3d in terms of the anticipated incremental impacts of each alternative beyond the no action / existing conditions (Table 4-1). Cumulative impacts of each alternative will be discussed later in Section 4.5 (Table 4-7). Impacts to important resources by alternative are discussed below in light of ongoing O&M experiences and the final results of 1 of 3 sedimentation models that have been completed for the study thus far. A one-dimensional (1D) sedimentation model based on the HEC-6T computer program was used to investigate long-term (multi-decade) system response to channel deepening alternatives (discussed in detail in Appendix C). System response was evaluated by comparison of plan condition (channel deepening) simulations to base condition (45-foot channel) simulations. The upstream shift in deposition projected by the 1D

model is accompanied by a very slight reduction in deposition below Head of Passes. That reduction occurs because less sediment is transported into Southwest Pass; however, there is still an ample supply of fine sediment entering the Pass. The 1D model result does not rule out the possibility that increased salinity and sediment flocculation will yield a net increase in fine sediment deposition.

It may be worth noting, that the large scale diversions that are currently being proposed upriver from Venice, LA, if ever constructed, would have much larger potential impacts on shoalingthan sea level rise and channel deepening. Those diversions, if constructed and depending on size, could shift deposition to a location upstream of Venice (as opposed to upstream of Cubit's Gap). In "wet" years, the combined effects of sediment diversions and increased upstream deposition could potentially reduce sediment loads passing Venice enough to reduce dredging downstream of Venice, LA. However, because future diversions are not part of the reasonably foreseeable future, impacts to future diversions associated with project alternatives are not evaluated.

An Adaptive Hydraulics (AdH), two-dimensional (2D) sedimentation model will be used to investigate the potential effects of channel deepening on maintenance of the channel crossings (upstream of Belle Chasse, LA) and shoaling and/or lateral bar growth (downstream of Belle Chase, LA). An existing 2D model developed for the Mississippi River Hydrodynamic and Delta Management Study will be adapted to the requirements of this study. The project TSP will be evaluated using a 3D model in order to determine the project impact on salinity intrusion and shoaling. Upon conclusion and analysis of pending 2D and 3D model findings, results will be incorporated in the final SEIS to support feasibility level analysis and will be provided to the resource agencies to conclude coordination of regulated and protected resources.

4.1.1 Alternative 3

Alternative 3 would require construction and maintenance of twelve river crossings to 50 ft LWRP and the lower river (RM 13.4 AHP – RM 22 BHP) to a depth of 50 feet MLLW. Construction and O&M quantities under Alternative 3 for the crossings and the lower river are exhibited in Table 4-1.

For the purposes of discussion, preliminary wetland value assessments (WVA) have been performed in order to quantify the benefits achieved from using construction and O&M material beneficially (Appendix A-7). Because the alternatives that consider beneficial use in the lower river would not impact wetlands except for the minor, temporary, and incidental impacts associated with accessing beneficial use (i.e., wetland creation sites), the project would not require compensatory mitigation (Section 4.6).

Table 4-1 Incremental impacts of each alternative . Alternative 1 included as reference of existing practice/conditions.

	Crossings Construction	Lower River Construction	Annual O&M Crossings	Annual O&M Lower River	Acres created
Alt. 1	0	0	13,069,498	22,250,000	528/year
Alt. 2	5,467,000	0	25,327,502	0	0
Alt. 3	8,588,600	19,900,000	35,307,502	0	1462.5
Alt 3d	616,600	19,900,000	5,087,000	0	1462.5

Depending on need and availability, both construction and maintenance activities would utilize dustpan, hopper and cutterhead dredges to maintain the crossings and the lower river under Alternative 3. It is anticipated that construction and maintenance would occur across 12 crossings (Table 2-3). Material dredged during both construction and maintenance of crossings would be placed immediately downstream, (via agitation dredging from dustpan, direct deposit from hoppers, or pumping via cutterhead), in areas greater than 50 ft LWRP. Maintenance of crossings is anticipated to be more than twice that of the current maintenance quantities, from 19,419,180 cy to 48,377,000 cy (Table 4-1).

Construction of the lower river would occur at various shoals from RM 13.4 AHP to RM 19 BHP with cutterhead dredges over 4 years and that all material would be used beneficially to the extent possible under the Federal Standard. It is anticipated that construction from RM 10 to RM 19 BHPB would result in 1462.5 acres of fresh marsh habitat over the 4-year construction period. It is also anticipated that construction of the bar channel would occur at shoals from RM 19 BHP to RM 22 BHPB with hopper dredges utilizing the Ocean Dredge Material Disposal Site (ODMDS) over 4 years. One dimensional sedimentation modeling concludes that shoaling in the lower river would not be anticipated to increase as a result of deepening from 48 ft to 50 ft (Table 4-3 and 4-5, Appendix C). As such, maintenance of the lower river would not be anticipated to increase. Alternative 3 is not anticipated to require additional maintenance dredging at a depth of 50 ft in the lower river; therefore an incremental benefit from beneficial use of dredged material during annual maintenance is not anticipated.

The current evaluation has determined that construction and/or OMRR&R of the alternatives beyond 48 ft in the Lower Mississippi River reach of the project (RM 13.4 AHP to RM 22 BHP) will potentially require the acquisition of additional dredged material placement areas, either through exercise of the Federal navigation servitude or, if necessary, by the acquisition of a real property interest in privately owned lands or on lands under the jurisdiction of USFWS or LDWF.

The determination of whether such additional lands are required for project construction of the TSP will not be made until the final feasibility design phase. If such lands are determined to be necessary, the Government intends, during that phase, to also identify the extent of the Federal navigation servitude as it relates to the additional areas for dredged material placement and access. acquisition of a real property interest in privately owned lands. Refer to Chapter 5 and the Real Estate Plan (Appendix B) for additional information. The area identified as "Original Cleared Disposal Area" is 143,264 acres, the proposed expansion area adds an additional 24,054 acres for a combined total of 167,318 acres, shown as the total area with the "Proposed Expanded Disposal Area." (Figure 4-1).

Figure 4-1 Expanded disposal area under Alternative 3 and 3d.

4.1.2 Alternative 2

Alternative 2 would not require construction work in the lower river, but it would require construction and maintenance of twelve river crossings to a depth of 48 feet (LWRP). Constructing and maintaining the deep draft crossings (from 45 ft LWRP) to 48 ft LWRP would typically require the use of dustpan dredges; however, hopper dredges and cutterheads may occasionally be utilized, in emergency situations. Material for both construction and maintenance would be placed immediately downstream (via agitation dredging from dustpan, direct deposit from hoppers, or pumping via cutterhead), in areas greater than 50 ft (LWRP).

A total of 5,467,000 cubic yards (cy) would be dredged during a construction window of 1-2 years (Table 4-1). Once construction is completed, approximately 25,327,502 cy would be removed from the crossings annually via the three dredge types previously identified (Table 4-1).

4.1.3 Alternative 3d / Tentatively Selected Plan

Alternative 3d only differs from Alternative 3 in that it would deepen and maintain fewer crossings (i.e., a subset of 3 crossings) to 50 ft (LWRP). Construction and O&M quantities under Alternative 3d for three crossings and the lower river are exhibited in Table 4-1. For Alternative 3d, activities in the lower river would not differ from those previously described under Alternative 3. Rather than deepening the 12 crossings, Alternative 3d would deepen a subset of those crossings, specifically Rich Bend crossing (Mile 160-155), Belmont crossing (Mile 156-151), and Fairview crossing (Mile 117-111). Deepening this subset of crossings would allow for deep draft access to the Port of South Louisiana.

4.2 Water Environment

4.2.1 Mississippi River

Alternative 3

Direct and Indirect Impacts: Under Alternative 3, the project area would be constructed and maintained to a depth of 50 feet. The recent trend in shoaling between RM 13.4 AHP and RM 6 AHP in the vicinity of Venice, LA, is anticipated to increase due to additional channel deepening and eustatic sea level rise. Because MVN places material directly back into the downstream channel as it dredges the crossings, the sediment load is not anticipated to change above RM 13.4 AHP. As such, construction and maintenance of the crossings is not likely to have an impact on existing diversions as the sediment budget of the river would remain constant. Because construction and maintenance of the lower river would remove sediment from the system, negative impacts (i.e., additional shoaling) in existing anchorage areas are not anticipated.

Construction of crossings to 50 ft (LWRP) would require 8,588,600 cy over a 1-2 year period (Table 4-1). It is anticipated that three crossings would be constructed beginning at Fairview crossing, continue upriver, and cease at Rich Bend crossing. Construction of the crossings to 50 ft (LWRP) would require 8,588,600 cy over a 1-2 year period (Table 4-1). Once constructed, average annual maintenance of crossings would increase from existing practice by approximately 35,307,502 cy in these crossings. Dredged material would remain in the Mississippi River system and would be disposed of in deeper portions of the river immediately downstream.

Construction would temporarily disrupt transportation, navigation, and commercial fishing in project areas. Disturbances due to dredging activities, such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments, would likely have a short duration before returning to pre-dredging conditions. Impacts to localized fisheries would be temporary and minimal because the river system is a highly turbid system. The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are available. Because MVN dredges and places material back into the channel at the crossings, crossing construction and maintenance would not likely to affect sediment supply on existing downstream diversions.

Because of saltwater intrusion and relative sea level rise, based on study area loss rates from 1932-2010, the 1462.5 acres that would be created during construction of Alternative 3 would likely be reduced by approximately 57 percent to open water, by 833.6 acres after 50 years. However, it is anticipated that the proposed project would not result in overall adverse direct or secondary impacts to the aquatic environment and human environment in or near the project area.

Alternative 2

Direct and Indirect Impacts: Under alternative 2, the 12 crossings would be constructed and maintained at 48 feet (LWRP). The sediment load within the river would not be expected to change because as CEMVN dredges the crossing it would place material directly back into the downstream channel. As such, crossing construction and maintenance would not be likely to impact sediment supply for existing river diversions. Construction would temporarily disrupt transportation, navigation, and commercial fishing in project areas: however, these impacts would continue to be minor and temporary during the period of construction.

Construction of crossings to 48 ft LWRP would require 5,467,600 cy over a 1-2 year period. It is anticipated that three crossings would be constructed each year beginning at Fairview crossing and work sequentially upriver and cease after Rich Bend crossing. Once constructed, average annual maintenance of crossings would increase from existing practice approximately 25,327,502 cy.

Marsh creation would not occur under Alternative 2 because maintenance activities would not increase in the lower river and construction would not occur; however, approximately 528 acres of intermediate marsh would continue to be established annually as part of the project under the no action alternative. Because MVN dredges and places material back into the channel, crossing construction and maintenance would not likely have a cumulative impact on water levels, sediment transport, and existing diversions.

Disturbances due to dredging activities, such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments, would likely have a short duration before returning to pre-dredging conditions. Impacts to localized fisheries would be temporary and minimal because the river system is a highly turbid system. The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are available.

Alternative 3d

For Alternative 3d, activities in the lower river would not differ from those previously described under Alternative 3. Alternative 3d only differs from Alternative 3 in that it would deepen fewer crossings (i.e., a subset of crossings) to 50 ft (LWRP). A total of 616,000 cy would be dredged from water bottoms during construction and disposed of in deeper adjacent areas in the river. Once constructed, average annual maintenance within these 3 crossings would increase by approximately 5,087,000 cy in these crossings. (Table 4-1).

Disturbances due to dredging activities, such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments, would likely have a short duration before returning to pre-dredging conditions. Impacts to localized fisheries would be temporary and minimal because the river system is a highly turbid system. The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are available.

4.2.2 Mississippi River Delta

Alternative 3

Direct and Indirect Impacts: Deepening the crossings upstream of New Orleans, LA, to 50 ft would not be expected to affect coastal land building/loss. Dredged material from the crossings would remain in the Mississippi River system and would be disposed of in deeper portions of the river immediately downstream; therefore, the sediment supply to the lower river is not anticipated to change.

According to wetland value assessment models (Appendix A-7), approximately 576.5 AAHUs of intermediate marsh would be created during construction of 1462.5 acres of intermediate marsh under Alternative 3 from work in the lower portion of the river. Based on historic land loss, approximately 1082 acres would remain after 50 years (Appendix A-7).

Deepening of the channel could have impacts on the frequency and location of the salt-water sill that occurs in the deep draft channel. Comparison of alternatives initially considered the frequency of implementation of the sill for salt-water intrusion impact. However, the evaluation determined that there would be limited, if any, change in the frequency of construction of the sill for all of the alternatives. This will be further assessed with a 3D hydraulic model during feasibility level design.

With implementation of the TSP there would be some minimal and insignificant impacts to wetland resources. Depending on the existing conditions of the surrounding environment at the time of dredging and beneficial use placement, a small, undetermined amount of wetland habitat may be temporarily impacted by accessing to the open water proposed disposal areas. However, these minor, incidental impacts would be temporary and would occur as a result of coastal habitat creation. It is anticipated, that through the efforts taken to avoid wetlands impacts and the beneficial use of dredged material that functionally compensates unavoidable remaining impacts, the proposed project would not result in overall adverse direct or secondary impacts to the aquatic environment and human environment in or near the project area. Due to the incidental benefits achieved from beneficial use, the project is anticipated to have a net benefit in the delta area.

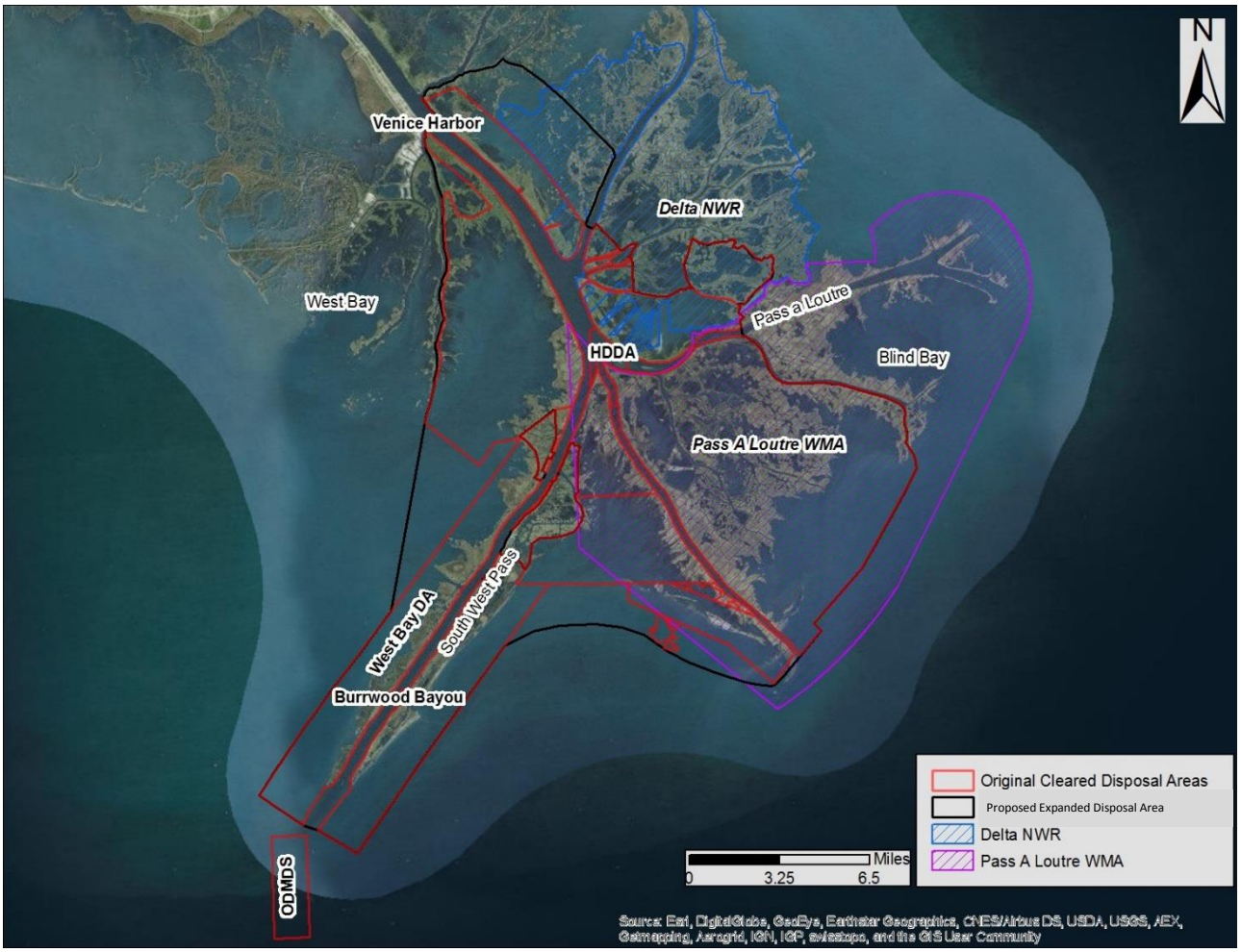

Figure 4-2 Beneficial use area in the Mississippi River Delta. (HDDA represents the open water Hopper Dredge Disposal area, and the ODMDS represents the Ocean Dredge Material Disposal Site)

Alternative 2

Direct and Indirect Impacts: Coastal habitat would not be created under Alternative 2. Deepening the crossings to 48 ft (LWRP) upstream of New Orleans, LA, is not anticipated to affect coastal land building/loss. Dredged material would remain in the Mississippi River system and would be disposed of in deeper portions of the river immediately downstream; therefore, the sediment supply to the lower river would not be expected to change. At this time, deepening the crossings would not be expected to influence the frequency and duration of saltwater wedge migration that threaten drinking water supplies upriver; however, modeling results are still ongoing. Regardless of results, it is anticipated that appropriate mitigation measures associated with potential impacts to the saltwater wedge (identified in Chapter 2) would be taken to avoid such impacts, should they occur.

Alternative 3d

For Alternative 3d, activities in the lower river and delta area would not differ from those previously described under Alternative 3. Dredging operations in the crossings would not be expected to affect the delta and lower river area.

4.2.3 Water Quality

Alternative 3

Direct and Indirect Impacts: The upper reach of the river from Baton Rouge to New Orleans has 12 crossings where channel depths are generally maintained at a depth of 45 feet. At 11 of the crossings, sediment samples were collected along with river water for chemical analyses of the sediment and dredging elutriates, where dredging would occur to deepen the river. Dredge slurry was collected directly from the discharge lines of dustpan dredges performing maintenance on 11 Deep Draft Crossings during Fiscal Year 2016. The solid and liquid fractions of the slurry were analyzed individually for the presence of EPA priority pollutants including metals, pesticides, PCBs, and semi-volatile organic compounds. With over half of the analysis complete at the time of this draft, metals were common to both fractions, and were detected at or below background levels in the Mississippi River. Chlordane pesticides and hydrocarbon exhaust products were detected infrequently in the solid samples, but at levels generally at or below 1 part per billion. All contaminant detects in dredge slurry were below regulatory water quality criteria and ecological screening values, and dredging of the crossings is not expected to have a negative impact on human health or the environment.

As 2D and 3D models are completed, this section will be updated with an evaluation of any potential direct or indirect impacts as it relates to drinking water intakes (three identified) in close proximity or just downstream of the crossings locations. Figure 4-7 shows the Donaldsonville intake at the Smoke Bend Crossing and Figure 4-8 shows two intakes for the St. James Water Districts #1 and #2 in relation to Belmont Crossing. Based on the chemical analyses of half of the sediment contaminant samples, elutriate concentrations of contaminants are not above water quality criteria, and potential impacts to drinking water intakes are not anticipated.

As described in Chapter 2, for the No Action Alternative, other on-going activities and sources of impairment will continue to influence surface water quality, which would be beyond the impacts of the proposed action.

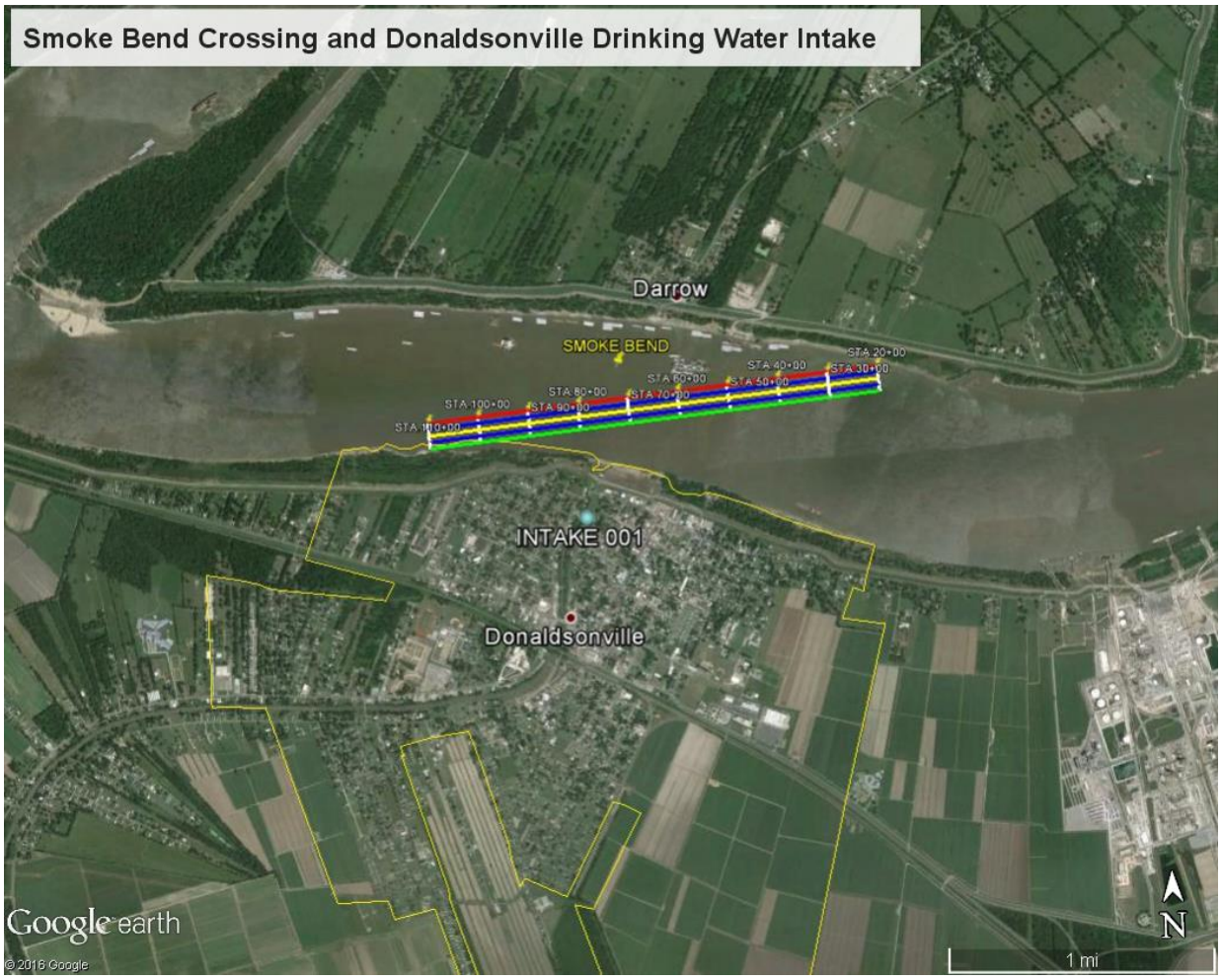

Figure 4-3 Smoke Bend Crossing and Donaldsonville Drinking Water Intake

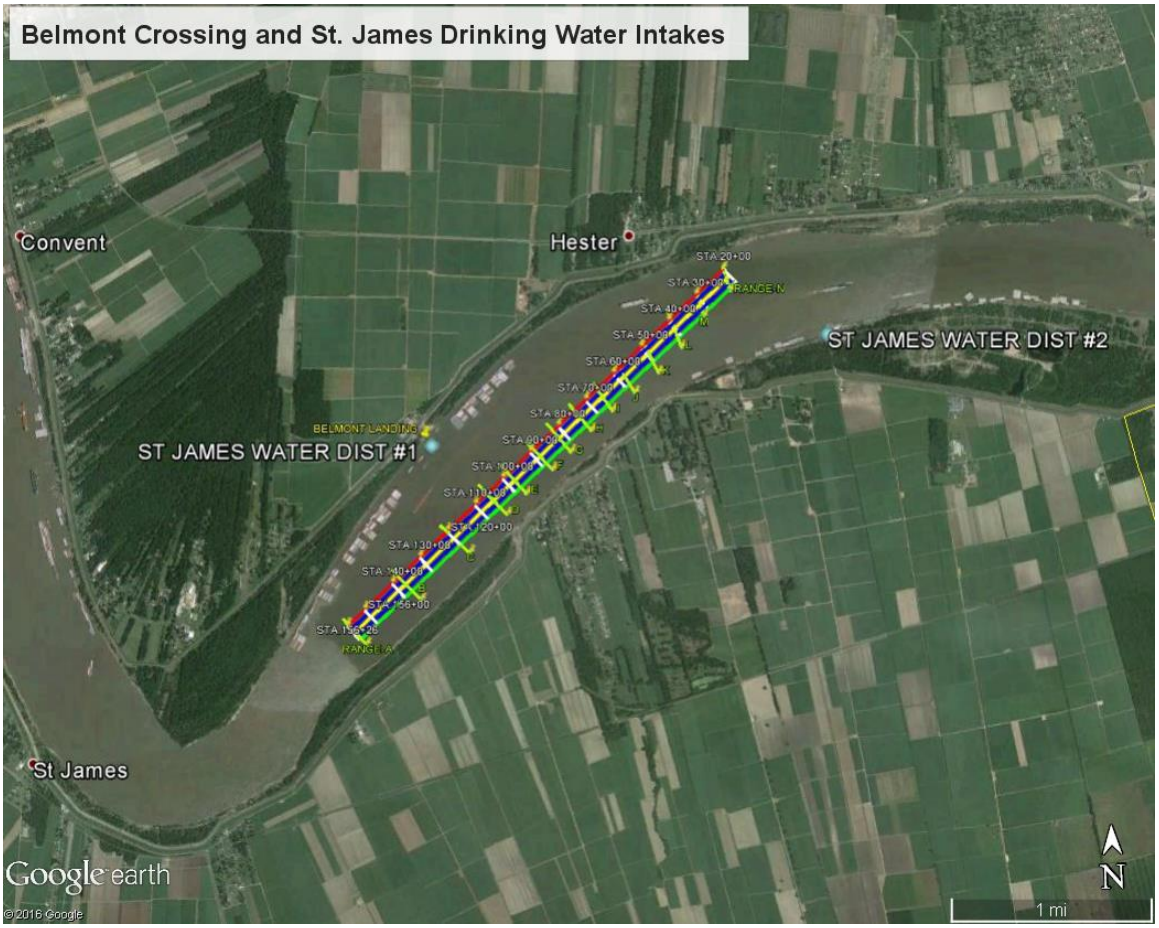

Figure 4-4 Belmont Crossing and St. James Water District #1 and #2 Intakes

Alternative 2

Direct and Indirect Impacts: See *Direct and Indirect Impacts* section for Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.2.4 Salinity

As previously discussed, impacts are discussed below in light of the results of 1 of 3 sedimentation models that have been completed and analyzed for the study. A one-dimensional (1D) sedimentation model based on the HEC-6T computer program was used to investigate long-term (multi-decade) system response to channel deepening alternatives (Appendix C). It should be noted

that the 1D model does not address the extent or frequency of salinity intrusion due to channel deepening or relative sea level rise. The salt water wedge is present throughout the year in Southwest Pass and during low flow conditions may intrude upstream of Head of Passes. Fine sediments tend to flocculate when fresh water encounters saline water enhancing sediment deposition. Increased frequency and extent of salinity intrusion, due to channel deepening or relative sea level rise, could increase the contact area between fresh and saline water. However, such increases are most likely during low flow periods when fine sediment concentrations are relatively low.

Alternative 3

Direct and Indirect Impacts: Despite the data-gaps involving two pending hydraulic models, it appears there would be little if any change in the frequency of construction of the sill for all of the alternatives. The evaluation determined that historically through the process of using localized reference gages, as described in chapter 3, the channel has been deepened over time from a depth of 45 ft. to a depth 48.5 ft MLLW, without an apparent change in the frequency of the construction of the sill. Further, since the construction of Phase I the frequency of construction of the sill has not changed. The frequency of enacting the sill is still on a 10 yr. basis. USACE will continue to investigate saltwater intrusion with additional modeling under feasibility design.

The saltwater wedge is further expected to be influenced by eustatic sea level rise. Under alternative 3, over 50 years, the marshes of Plaquemines Parish are anticipated to continue to decline and convert to marsh and open water, in turn affecting local water quality conditions. Climate change, relative sea-level rise, and hurricane/tropical storm surge would speed the process of saltwater intrusion in the area of the lower river.

Alternative 2

Direct and Indirect Impacts: There would be no direct impacts to salinity under alternative 2. Current salinity gradient trends are expected to continue. The saltwater wedge is expected to be negatively influenced by eustatic sea level rise. Under alternative 2, over 50 years, the marshes of Plaquemines Parish are anticipated to continue to decline and convert to marsh and open water, in turn affecting local water quality conditions. Climate change, sea-level rise, and hurricane/tropical storm surge would speed the process of saltwater intrusion in the area of the lower river.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3. The project TSP will be evaluated using a 3D model in order to determine the project impact on salinity intrusion and shoaling.

4.3 Human Environment

4.3.1 Population and Housing

Alternative 3

Direct and Indirect Impacts: Deepening the river and crossings would have minimal impact on the population. Deepening the river has the potential to increase business activity at ports in the study area. An increase in business may have a positive impact on the rate of employment in the population and potentially increase population numbers in the regions where ports are located.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.2 Employment and Industrial Activity

Alternative 3

Direct and Indirect Impacts: Deepening the river from 45 to 50 ft would reduce the inefficiencies currently caused by insufficient depth. More sufficient navigation would reduce the light loading, tidal/river stage delays, and frequency of operation and maintenance dredging intervals andallow for easier maneuvering..

A reduction in inefficiencies may encourage shipping-related businesses to expand, potentially increasing the employment rate in the study area.

Negative impacts on business and industrial activity during construction of the project would be temporary and minimal.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.3 Public Facilities and Services

Alternative 3

Direct and Indirect Impacts: River deepening would have a temporary and minor impact on public ferry services, public boat launches, and recreation near the deepening site.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for the TSP.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.3.4 Transportation

Alternative 3

Direct and Indirect Impacts: Hydraulic cutterhead dredges and disposal pipelines may cause minor and temporary interference of navigation by blocking sections of the channel, but are not expected to interfere significantly with shipping traffic. Dredging operations would be closely coordinated with representatives of the navigation industry and a Notice to Mariners would be posted by the USCG. Beneficial use-placement of dredged material in the proposed shallow open water areas could cause minor disruptions to small vessels using these portions of the project area; however, the effects on navigation would be mainly temporary. Portions of the proposed disposal areas may become inaccessible to some watercraft as wetland vegetation eventually colonizes the area; however, the shallow nature of the area currently limits most vessel access. There would be impacts to the transportation of goods along the river in the study area. Deepening the river and crossings would eliminate the inefficiencies currently caused by insufficient river depth. Transportation of goods may be interrupted during dredging, but impacts would be temporary. Public ferry services near deepening sites may also be temporarily interrupted.

Alternative 2

Direct and Indirect Impacts: Dredging operations would be closely coordinated with representatives of the navigation industry and a Notice to Mariners would be posted by the USCG. Implementing Alternative 2 would result in the same impacts described for the Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.5 Community and Regional Growth

Alternative 3

Direct and Indirect Impacts: There would be no direct impacts on community and regional growth. Indirectly, some growth in population may occur due to increased businesses at the port facilities in the study areas.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for the Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.6 Community Cohesion

Alternative 3

Direct and Indirect Impacts: Implementing Alternative 3 would have neither direct nor indirect effects on community cohesion.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.3.7 Cultural and Historic Resources

Alternative 3

Direct and Indirect Impacts: There are twelve regularly maintained crossings that would be deepened from 45 ft deep to 50 ft deep, under this alternative. Both dredging depths include an additional 2 ft of advance maintenance, and 2 ft of allowed overdepth. The potential direct impact of the TSP is that any historic property located at the depth of new dredging that may have remained intact by being buried, could be destroyed by dredging. An indirect impact may be that if deeper channel crossings and the SW Pass lead to deeper draft shipping, the larger size of these watercraft may have unexpected effects via wave wash or other unpredicted physical factors that adversely affect cultural resources outside of the main shipping channel or along the banks of the river.

Alternative 2

Direct and Indirect Impacts: The direct and indirect impacts of this alternative would be the same as for the TSP. As regards cultural resources and historic properties, there is no effective difference between deepening to 50 ft or only 48 ft.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.3.8 Aesthetics and Visual Resources

Alternative 3

Direct and Indirect Impacts: Direct Impacts to Visual Resources would be minimal to negligible. The project area is remote and far removed from major thoroughfares, major urban areas, places of single-family residence, and local businesses. User activity is low and primarily relegated to water traffic only. There may be some minimal direct impacts to areas where the project boundary spreads over the Delta National Wildlife Refuge and Pass A Loutre Preserve Wildlife Management Area. Indirect Impacts may occur do to operation of machinery and construction activities in the areas where dredging would take place, but these impacts would be minimal. Use of beneficial materials dredged from the channel may create an indirect impact, depending on where and how that material is used in the future. Continued relative sea level rise could also impact the entire area, resulting in vast areas of shallow open water as vertical accretion rates fail to keep pace with rising sea levels.

Alternative 2

Direct and Indirect Impacts: Implementing Alternative 2 would result in the same impacts described for the TSP.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.9 Noise

Alternative 3

Direct and Indirect Impacts: Due to the nature of construction and O&M, the greatest noise impacts are anticipated to be associated with the extended maintenance periods of Alternative 3 over 50 years. It is anticipated that, in some instances, noise impacts may be an important issue because of their potential effects on wildlife, such as disruption of normal breeding patterns and abandonment of nesting colonies. However, tolerance of unnatural disturbance varies among wildlife. Therefore, these issues shall be addressed by identifying the key species of concern and following feasible administrative and or engineering controls, determining and implementing appropriate buffer zones, and implementing construction "activity windows" (i.e., project construction initiation and completion dates to minimize disturbance to nesting birds).

Terrestrial wildlife may be directly impacted during the placement of beneficial use of dredged material; however, most wildlife would temporarily relocate during construction. There is the potential for noise or wave action generated by construction activities to displace terrestrial wildlife in the area; however, this would be a temporary disturbance, with wildlife likely to return following the completion of disposal activities. Migratory waterfowl and other avian species, if present, would likely be only temporarily displaced from the project area. Overall, populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities.

Overall, noise impacts associated with construction and O&M would be minor in relation to the ambient noise that occurs in the busy industrial corridor. Localized and temporary noise impacts would likely continue to affect animals and the relatively few people in the remote areas. Potential noise impact concerns may be expected for workers at oil and gas extraction sites, recreationists, and construction activities. Additional noise impacts would be associated with the villages, towns, and clusters of human habitations. Institutional recognition of noise, such as

provided by the regulations for Occupational Noise Exposure (29 CFR Part 1910.95) under the Occupational Safety and Health Act of 1970, as amended, would continue.

Alternative 2

Direct and Indirect Impacts: No permanent noise impacts would occur as a result of Alternative 2 and all noise emissions would be relatively short-term, ending after construction. Due to the nature of construction and O&M, the greatest noise impacts are anticipated to be associated with the extended maintenance periods of Alternative 2 over 50 years. The temporary impacts from the maintenance period for Alternative 2 are similar to those previously described for Alternative 3 above, however, the noise caused by Alternative 2 is expected to be of shorter duration than Alternative 3.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.3.10 Recreation Resources

Alternative 3

Direct and Indirect Impacts: The dredging of the Mississippi River at the crossings would have minimal impacts on recreational use. Much of the recreation impacts associated with the TSP, are related to the placement of dredge material. The material dredged at the crossing locations will be placed back into the water for transport further south. Recreationists would be temporarily displaced during construction and disposal of dredge material. New disposal sites in the Delta NWR cross into designated waterfowl hunting areas, which would most likely be temporary unavailable for use during dredge material placement. Fishing, hunting, and boating for users of the camps and campgrounds would also be affected during times of dredging and material placement.

As stated previously, about 24,000 acres in the study area are proposed to receive dredge material during three dredge cycles per year. Approximately 9,000 acres are in the Delta NWR, 1,265 acres in the Pass a Loutre WMA and the remaining 14,700 acres are in the Southwest Pass area. All work is coordinated closely with land managers from each agency to ensure compliance. Much of the receiving area that would be converted to land/marsh consists of mainly shallow open water with some eroded marsh. Less water would be available for boating and fishing; however, an increase in habitat value would be expected as the disposal area would accept the dredge material in its highly turbid form and in time, become continuous, not-turbid, brackish marsh. The creation

of marsh would provide an increase in fish and wildlife habitat including nesting habitat for water fowl and nursery habitat for fish. Consumptive recreation use would likely increase as a result of an increase in quality and quantity of fish and wildlife habitat. Bird watching opportunities are also expected to increase because of improved habitat for neo-tropical migratory songbirds.

Alternative 2

Direct and Indirect Impacts: There would be fewer impacts to recreational resources with Alternative 2 than with Alternative 3. The duration of the impacts described previously under Alternative 3 would be less. Alternative 2 does not include deepening Southwest Pass from 48 ft to 50 ft, so there would be no additional dredge material placement in the marsh areas surrounding the Pass. Dredging of the crossings further north, up river, would have no impacts on recreational resources.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3

4.3.11 Air Quality

Alternative 3

Direct and Indirect Impacts: With implementation of the proposed action, on-site construction activities would be expected to produce less than 5 tons per year of VOC emissions and less than 60 tons per year of NOx emissions in East Baton Rouge Parish; less than 5 tons per year of VOC emissions and less than 60 tons per year of NO_X emissions in West Baton Rouge Parish; and less than 5 tons of VOC emissions and less than 75 tons of NOx in Ascension Parish (less than the *de minimis* level of 100 tons per year per pollutant). Thus, the ambient air quality in East Baton Rouge, West Baton Rouge, and Ascension Parishes would not noticeably change from current conditions, and the status of attainment for the parishes would not be altered.

However, Iberville Parish, on-site construction activities would be expected to produce less than 10 tons per year of VOC emissions and approximately 140 tons of NOx emissions. The 140 tons of NOx emissions exceeds the *de minimis* level of 100 tons per year of NOx emissions approved by the State Implementation Plan. As such, in order to avoid exceeding the de minimis level for NOx, construction of the four crossings within Iberville Parish would take a phased approach and would be staged at a rate of one crossing per year.

St. James, St. Charles, and Plaquemines Parishes are currently in attainment of all NAAQS and are operating under attainment status. Calculations previously performed on fairly large

construction projects indicate that volatile organic compound emissions from typical CEMVN construction projects would be well below the 100-ton per year *de minimis* limit; therefore, it is expected that there would be no adverse impacts to air quality with the implementation of the proposed action. The status of attainment for St. James, St. Charles, and Plaquemines Parish would not be altered from current conditions, and there would be no lasting direct or indirect impacts resulting from the associated construction activities.

Alternative 2

Direct and Indirect Impacts: Ambient air quality in East Baton Rouge, West Baton Rouge, and Ascension Parishes would not noticeably change from current conditions, and the status of attainment for the parishes would not be altered. However, as explained for Alternative 3, on-site construction activities are expected to produce less than 10 tons per year of VOC emissions and approximately 140 tons of NOx emissions in Iberville Parish. The 140 tons of NOx emissions exceeds the *de minimis* level of 100 tons per year of NOx emissions approved by the State Implementation Plan. As such, in order to avoid exceeding the de minimis level for NOx, construction of the four crossings within Iberville Parish would take a phased approach and would need to be staged at a rate of one crossing per year.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3. All 3 crossings are in attainment of air quality standards. Ambient air quality is not expected to be altered from current conditions.

4.4 Natural Environment

4.4.1 Soils and Water bottoms

Alternative 3

Direct and Indirect Impacts: Alternative 3 would result in direct impacts to existing water bottoms in the navigation channel. Dredging at all locations would be to a maximum width of 500-feet resulting in approximately 2,800-acres of direct impacts to water bottoms in the Mississippi River.

Dredged material from the Mississippi River would be placed in the Mississippi River Delta to create coastal habitat that includes emergent and high marsh, bird islands, and deltaic ridges. The placement of the dredged material in the disposal areas would result in direct impacts to water bottoms. Hydric soils in the disposal areas consist of Aquents, Balize silty clay loam, Larose mucky clay; and less frequently Carville, Cancienne, and Shriever silty clay. Indirect impacts from the placement of dredged material would include greater soil stability in the Delta as shallow open

water bottoms are filled and vegetation density increases. The increase in land and soil stability would provide greater diversity in habitat for wildlife and improve storm surge protection for the Louisiana coast. The direct impacts to water bottoms in the long term would contribute to positive indirect impacts resulting in greater habitat diversity for wildlife, essential fish habitat, and recreational opportunities in the Mississippi River Delta.

Overall, the direct and indirect impacts to soils and water bottoms resulting from the placement of dredged material to create coastal habitat would be beneficial.

Alternative 2

Direct and Indirect Impacts: The direct and indirect impacts to soils and water bottoms under Alternative 2 would be essentially the same as Alternative 3 for construction of the crossings. Alternative 2 would increase operation and maintenance of the Mississippi River deep-draft navigation channel from the current 45 ft to 48 ft in depth, resulting in direct impacts to existing water bottoms in the navigation channel. Construction and maintenance dredging in the Mississippi River would occur at up to 12 crossings and from river mile 13.4 AHP to mile 22 BHP in Southwest Pass. Dredging at all locations would be to a maximum width of 500 –ft, resulting in approximately 2,800-acres of direct impacts to water bottoms in the Mississippi River. Soils and water bottom impacts would not be anticipated to occur in the lower river.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3. Water bottoms would only be affected within 3 crossings.

4.4.2 Vegetation Resources

Alternative 3 (a depth of 50 ft for the Crossings and a depth of 50 ft in Lower Mississippi River)

Direct and Indirect Impacts: Deepening the crossings to 50 ft (LWRP) would not be anticipated to have impacts on vegetation in the batture or the lower river area. With implementation of the proposed action there would be some minimal and insignificant impacts to wetland resources. A small, undetermined amount of wetland habitat would be temporarily impacted during the excavation of channels to provide equipment access to the proposed disposal areas. The resulting loss of wetland function would be temporary, as these areas would be backfilled to pre-project marsh elevations and eventually revegetated (naturally) and restored upon completion of the project. Direct placement of dredged material on existing marsh would be avoided. Submerged aquatic vegetation (SAV) persists in shallower, protected areas of the disposal area. It is estimated

that less than 10 percent of the open water disposal area contains SAVs. The area would be subjected to increases in RSLR, which could increase saltwater intrusion and lead to increases in and the potential conversion of remaining SAVs to open water. Much of the area, could be permanently inundated under both the intermediate and high RSLR scenarios. There could be a shift from fresh water dominant species to those species that can tolerate higher salinity.

Impacts to SAVs may occur, but with beneficial use of dredged material to the extent permissible under the requirements of the Federal Standard, impacts to fisheries habitat is anticipated to be beneficial. With implementation of alternative 3, there would be positive impacts to wetlands in the project area. Up to 1462.5 acres of new marsh and elevated wetlands would potentially be created in existing shallow open water areas with the beneficial use of dredged material within the Federal Standard removed during maintenance dredging of the Mississippi River. Due to variability in disposal placement and settling rates, a small percentage of scrub shrub habitat may establish in some higher portions of the placement during the first few years of settlement to the targeted elevation of 2 ft. Due to high rates of land loss in the area, approximately 628.9 acres would be expected to remain after 50 years (Figure 2-7).

Newly created or nourished wetlands would provide additional foraging, breeding, nesting, and nursery areas, as well as refugia for a multitude of estuarine-dependent and commercially important fish and shellfish, migratory waterfowl, wildlife, and several species of wading, diving, and shore birds, and help to offset the substantial wetlands loss currently taking place in this portion of the Mississippi Deltaic Plain. Thus, positive direct and indirect impacts to wetlands and wetland-related resources in the project area would be expected with implementation of the proposed action. Overall, there would be positive net benefits to wetland resources in the project area, with the creation of emergent wetland habitat of higher value to fish and wildlife resources than the existing open water.

Alternative 2

Direct and Indirect Impacts: Deepening the crossings to 48 ft (LWRP) would not be expected to have impacts on vegetation in the batture or disposal areas.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.4.3 Wildlife

On October 11, 2016, the United States Fish and Wildlife Service (USFWS) provided a Draft Coordination Act Report, as required by the Fish and Wildlife Coordination Act (Appendix 8). The Service provided 12 Fish and Wildlife Conservation Recommendations in the report. MVN has reviewed the recommendations and responses are provided below:

1. The Service recommends that to the extent feasible all dredged material should be used beneficially to restore coastal habitats that are in decline.

Response: Concur. Dredged material will be beneficially used to the maximum extent practicable, subject to the requirements of the Federal Standard.

2. The Service and NMFS recommend the Corps evaluate options to enhance the sediment loads of proposed diversion projects or existing breaches in the vicinity of Mardi Gras Pass and Fort St. Phillip if dredging south of New Orleans is proposed in the future.

Response: Concur. If dredging south of New Orleans is proposed in the future, to the extent permissible under the USACE determination pursuant to 33 USC Section 408 and Sections 10/404 Regulatory determinations, the USACE will consider all reasonable alternatives, including those that could enhance the sediment loads of reasonably foreseeable diversion projects or existing breaches, in the context of adhering to the Federal Standard.

3. The Service and NMFS recommend the Corps expand the beneficial use areas to include areas near Spanish Pass.

Response: Do not concur. At this time the most appropriate areas available were identified, the proposed project involves the disposal of beneficial use of dredged materials at locations within the Federal Standard.

4. The Service recommends avoiding and/or minimizing impacts to wetlands, including submerged aquatic vegetation in the study area.

Response: Concur. The USACE will avoid and minimize, to the maximum extent practicable, potential project-induced adverse impacts to wetlands, submerged aquatic vegetation, and other natural resources in the study area.

5. The Service recommends avoiding and/or minimizing impacts to coastal restoration efforts in the study area and continued coordination with those efforts to avoid or minimize impacts to their effectiveness.

Response: Do not concur. Any coastal restoration effort that is constructed outside of a partnership with USACE for the construction of an authorized federal project, is subject to the 408 (33 USC Section 408) process and must avoid impacts to existing Corps water resources projects, including this project.

6. The Service recommends avoiding impacts to endangered or threatened species and their habitats, migratory birds, and colonial wading birds within and upstream of the study area as specified in this Fish and Wildlife Coordination Act Report. The service also recommends the Corps investigate the possibility of using dredged material to restore/create habitat for threatened or endangered species.

Response: Concur, in part. The USACE will avoid, to the maximum extent practicable, adverse project-induced impacts to endangered or threatened species and their habitats, migratory birds, and colonial wading birds within and upstream of the proposed study area. The USACE will also consider using dredged material to restore/create habitat for threatened or endangered species should those opportunities fall under the Federal Standard.

7. The Service recommends the Corps coordinate with the Service and other natural resource agencies in the planning of disposal areas and techniques and assessment of impacts and mitigation.

Response: Concur. The USACE will continue to coordinate with the Service as well as other natural resource agencies in planning disposal areas, the techniques utilized, assessment of the potential impacts, and potential mitigation.

8. The created wetlands should be monitored over the project life to help evaluate the effectiveness of these features and to document both the elevation and acreage of wetland areas created.

Response: Do not concur. Beneficial use of dredged material will not be monitored under this project. Beneficial use areas may be monitored under the CEMVN Beneficial Use Monitoring Plan contingent upon funding, as is current practice.

9. The Service and other resource agencies shall be provided an opportunity to review and submit recommendations on future detailed planning reports (e.g., Design Document Report, Engineering Document Report, etc.) and the draft plans and specifications on the Mississippi River Deepening Project addressed in this report.

Response: Do not concur. While the USACE will coordinate and consultation with regard to the Endangered Species Act, primarily with regard to plans and specifications review, the USACE

will not provide maintenance dredging plans and specifications to non-Corps agencies for outside review.

10. The Service recommends Special Use Permits be requested of the Delta National Wildlife Refuge (NWR) for any expected or proposed work on the Delta NWR. Close coordination by both the Corps and its contractor must be maintained with the Refuge Manager to ensure that construction and maintenance activities are carried out in accordance with provisions of any Special Use Permit issued by NWR. The Refuge Manager for the Delta NWR is Ms. Shelly Stiaes, (Shelly Stiaes@fws.gov or 337-882-2000).

Response: Concur. The USACE will coordinate with LaDOTD as the NFS to ensure LaDOTD secures the appropriate special use permit from the Refuge Manager for the Delta NWR for proposed work on the Delta NWR. USACE will review the special use permit prior to acceptance to determine that USACE can comply with all the conditions sought by USFWS in its proposed special use permit.

11. Louisiana Department of Wildlife and Fisheries (LDWF) and the Service recommend contacting the LDWF office, Mr. Shane Granier (504-284-5264), for further information regarding any additional permits or coordination that may be required to perform work on the Pass a Loutre Wildlife Management Area (WMA).

Response: Do not concur. For that portion of the Pass a Loutre WMA that falls within the Federal Navigation Servitude, USACE will exercise its rights under the servitude for purposes of the work to be performed within that area. Should any portion of the WMA fall outside of the lands and water bottoms that are subject to the Federal Navigation Servitude, the non-Federal Sponsor is required under the project authorization to provide USACE an authorization for entry to such lands and water bottoms. Therefore, any necessary contact regarding the required authorization for entry for lands and water bottoms under the jurisdiction of LDWF will be handled by the project's NFS.

12. If the proposed project has not been constructed within 1 year or if changes are made to the proposed project, the Corps should re-initiate Endangered Species Act consultation with the Service.

Response: Concur. The USACE will re-initiate Endangered Species Act consultation with the Service if the proposed project has not been constructed within 1 year or if significant changes are made to the proposed project.

Alternative 3

Direct and Indirect Impacts: With implementation of the proposed action, minimal adverse direct and indirect impacts to wildlife would be anticipated. Terrestrial wildlife generally would not be impacted, as construction activities would occur mainly over open water. There is the potential for noise or wave action generated by construction activities to displace terrestrial wildlife in the area; however, this would be a temporary disturbance, with wildlife likely to return following the completion of disposal activities. Migratory waterfowl and other avian species, if present, would likely be only temporarily displaced from the project area. Overall, populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities. The placement of dredge material for beneficial use would reduce some shallow open water habitat by converting it to marsh and other coastal habitat, thereby reducing available foraging habitat for some avian species. Migratory neotropic avian species that currently utilize the area as stopover habitat would benefit as forested wetlands and emergent wetland habitats are established.

Some positive indirect impacts to wildlife in the project area would be expected with the proposed action. Approximately 1,462.5 acres of productive coastal habitat, including marsh, elevated wetlands, scrub-shrub, and other shallow open water habitat would be created through the beneficial use of dredged material. According to wetland value assessment models (Appendix 7), 576.5 AAHUs of intermediate marsh would be established during construction of 1462.5 acres (and a net of 1082 acres) of intermediate marsh under alternative 3. Submerged and emergent vegetation, as well as scrub-shrub vegetation, potentially colonizing these areas would provide valuable and diverse habitat for foraging, refugia, nesting, and loafing of terrestrial wildlife, migratory waterfowl, and other avian species. Thus, it is anticipated that wildlife in and near the project area would ultimately benefit from the proposed activities. The reduction in the amount of shallow open water is negligible compared to that remaining in the project area.

The brown pelican (*Pelecanus occidentalis*), a year-round resident of coastal Louisiana that may occur in the project area, was removed from the Federal List of Endangered and Threatened Wildlife (i.e., “delisted”) by USFWS on November 17, 2009. Despite its recent delisting, brown pelicans, and other colonial nesting wading birds and seabirds, remain protected under the Migratory Bird Treaty Act of 1918. Portions of the proposed project area may contain habitats commonly inhabited by colonial nesting wading birds and seabirds. To minimize disturbance to pelicans and other colonial nesting birds and seabirds potentially occurring in the project area, MVN would observe restrictions on activity provided by the USFWS, Lafayette, Louisiana Field Office.

Special operating conditions addressing pelicans and other colonial nesting wading birds and seabirds, that would be included in all contract awards include:

Colonial Nesting Birds

Colonial nesting wading birds (including, but not limited to, herons, egrets, and Ibis) and seabirds/water-birds (including, but not limited to terns, gulls, Black Skimmers, and Brown Pelicans) are known to nest in the project area. The nesting birds and their nests must not be disturbed or destroyed. The nesting activity period extends from 15 February through 15 September. Dredging activity during this period may be subject to additional requirements as stated below. Note that below designations (e.g. "Section X") will be filled in with the appropriate alpha or numeric reference at the proper time.

"Implementation and Reporting:

a. In addition to the paragraph located in Section X, paragraph X entitled "Implementation and Reporting," the Contractor shall also submit the Bird Nesting Prevention Plan, see paragraph X entitled "Bird Nesting Prevention and Avoidance Measures."

b. The presence of nesting wading birds and/or seabirds/water-birds within the minimum distances from the work area, as specified in the paragraph entitled "No Work Distances," shall be immediately reported to CEMVN.

No-work distance restrictions are as follows:

Terns, gulls, and Black Skimmers - 650 feet;

Colonial nesting wading birds - 1000 feet; and,

Brown Pelicans - 2000 feet.

Coordination by the New Orleans District personnel with the U.S. Fish and Wildlife Service may result in a reduction or relaxing of these no-work distances depending on the species of birds found nesting at the work site and specific site conditions.

Bird Nesting Prevention and Avoidance Measures:

The Contractor shall prepare and submit to the Contracting Officer's Representative, for approval, a plan detailing the efforts that will be undertaken to prevent birds from nesting within the minimum distances, as specified in paragraph X entitled "No Work Distances,"

from any work activity. The plan shall be submitted in accordance with paragraph X entitled "Implementation and Reporting."

Nest prevention measures shall be intended to deter birds from nesting on the disposal area(s) and access corridor(s) without physically harming birds during the nesting activity period, as specified in the paragraph entitled "General." Nest prevention measures may be used in combination and/or adjusted to be most effective. The use of any harassment measures shall be in accordance with EM 385-1-1 (Safety and Health Requirements), dated September 15, 2008. At minimum, nest prevention measures shall include the following:

Flagging/Streamers - Flagging and/or streamers at least 2 ft in length and which consist of reflective plastic/mylar type material shall be attached to the top of stakes at least 3 feet in height. The stakes shall be driven into the ground at approximately 20-foot intervals. Flagging and/or streamers shall be placed such that the flags/streamers move in a light wind.

Vehicular/Pedestrian Traffic - At minimum, one terrain vehicle and/or one person shall travel throughout the entire disposal area at least once per hour from dawn to dusk.

Upon the exercise of Option Item "Bird Nesting Prevention and Avoidance Measures," the Contractor shall begin work within 24 hours. Specific nest prevention measures used during the work shall be monitored for effectiveness and may require adjustment and/or modification. All equipment/supplies used for nest prevention shall be removed from the work site upon the completion of work and as directed by the Contracting Officer.

If bird nests are discovered at the work site, immediate notification shall be made in accordance the paragraph entitled "Reporting." The Contractor shall immediately mark the bird nests with flagging on stakes 3-feet above the ground surface and no closer than 3 feet from the nest. The Contractor shall immediately implement safe work distances from the nest(s) as specified in the paragraph entitled "No Work Distances," place flagging to create exclusion zone(s) around the nest(s), and advise all equipment operators of the bird nest(s) and exclusion zone(s)."

Alternative 2

Direct and Indirect Impacts: Direct and indirect impacts on wildlife caused by crossing construction and maintenance would be expected to be minor in extent and short term in duration. Wildlife (deer, birds, raccoons, rabbits, etc.) that occur in the batture may be temporally

inconvenienced by nuisance noise caused by dredging, however, considering other ambient noises, impacts on wildlife would be relatively minor in extent and short term in duration. The special operating conditions identified for Alternative 3 would also be included in the contracts for Alternative 2.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3. Increases in ambient noise levels from construction upstream from the Port of South Louisiana would not affect surrounding wildlife in the batture area.

4.4.4 Aquatic and Fisheries Resources

Coordination with NMFS for impacts to and conversion of essential fish habitat is ongoing at the time of Draft release and no conclusions have been made at the time. Preliminary MVN findings are discussed in this section.

Alternative 3

Direct and Indirect Impacts: With implementation of the proposed action, there would be some minimal direct and indirect effects to aquatic resources/fisheries in the form of altered open water bottom habitat. A maximum of approximately 1462.5 acres of shallow open water bottoms would be temporarily or permanently impacted by the beneficial use-placement of dredged material into the proposed disposal areas. Based on the current estimate of 10 percent cover of SAVs in the disposal area, it is estimated that 146.3 acres of SAV habitat would be converted to intermediate marsh as a result of project construction.

It is anticipated that mobile fishery species would avoid proposed areas of disposal activities during the project period, thereby minimizing direct and indirect impacts to those species. Brown shrimp, white shrimp, and crabs may be directly impacted through the filling of shallow open water areas with dredged materials; however, these species could potentially indirectly benefit from the abundance of introduced detritus, and subsequent food resources, from these materials. Sessile or slow moving benthic organisms may be smothered in areas where dredged material is deposited for marsh creation. Sediment particles that become suspended due to disposal activities may impact filter-feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high. Clams and oysters, in particular, may experience a reduction in pumping rates with increased turbidity (Loosanoff 1961). The project area is not considered prime oyster habitat. Oysters would not be impacted because, per LDWF regulation, dredging would not occur within 1/2 mile of existing oyster lease boundaries, currently of which there is only one lease

in the study area. Currently, LDWF does not identify oyster seed grounds in the expanded disposal area. http://gis.wlf.la.gov/oystermap/map.html. CEMVN will identify/quantify the total acreages of leases (currently only 1) within the expanded disposal area, and then disclose that those areas come with some restrictions and pose additional challenges.

With implementation of the proposed action, some positive indirect impacts to fisheries in the project area would be expected. Beneficially used dredge material would be expected to create up to 1462.5 acres of new marsh platform and other coastal habitat in the proposed open water disposal areas. According to wetland value assessment models (Appendix 7), 576.5 AAHUs of intermediate marsh would be created during construction of 1462.5 acres of intermediate marsh under alternative 3 (noting that approximately 1082 acres would remain after 50 years). The expansive emergent and elevated wetland vegetation expected to colonize this area would enhance primary and secondary productivity in the area and provide substantial fisheries benefits resulting from valuable foraging, breeding, and nursery habitat for finfish and shellfish, while helping to offset the considerable wetlands loss currently taking place in this portion of the Mississippi River Delta. Creation of new marsh would provide highly productive fisheries habitat, increase detrital food material, and likely contribute to overall increased fisheries productivity in the project area. Benefits to both commercial and recreational fisheries would be expected.

Water quality and benthic species would be expected to rebound once project construction is complete. The restoration of fresh marsh in areas that are currently open water would provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus thereby increasing the primary productivity in the wetland system.

With implementation of the proposed action, initially some EFH for brown shrimp, white shrimp, and red drum would be directly impacted in the project area during the beneficial use-placement of dredged material for wetlands development in the shallow open waters of the proposed disposal areas. Up to approximately 1,462.5 acres of shallow open water bottom and associated EFH habitat (e.g., mud/sand substrates, SAV) would be potentially impacted by the placement of dredged material in the proposed disposal areas under alternative 3; however, these areas would be converted to generally more productive categories of EFH (e.g., estuarine emergent marsh, marsh edge, inner marsh, marsh/water interface) as they eventually become colonized by emergent vegetation. Thus, the proposed action would provide mainly positive indirect impacts to EFH in the project area, and any direct or temporary adverse impacts would be sufficiently offset by the net benefits from creating up to 1,462.5 acres of marsh, new shallow open water habitat, and associated EFH.

Additional, short term EFH impacts would include a temporary and localized increase in estuarine water column turbidity during the placement of dredged material in shallow open water areas; however, the project area is a naturally turbid environment and increased turbidity is not expected to significantly affect EFH needs within the project area.

Alternative 2

Direct and Indirect Impacts: With implementation of the Alternative 2, there would some minimal direct and indirect effects to aquatic resources/fisheries in the form of altered open water bottom habitat. Impacts to EFH would not be expected under alternative 2 because EFH does not occur within the river and there would be no impacts to coastal habitat in the vicinity of Southwest Pass. It is anticipated that mobile fishery species would avoid proposed areas of disposal activities during the project period, thereby minimizing direct and indirect impacts to those species. Sessile or slow moving benthic organisms may be smothered in areas where dredged material is removed. Sediment particles that become suspended due to disposal activities may impact filter-feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high. Since the project area is a naturally turbid environment and the majority of resident finfish and shellfish species are generally adapted to, and very tolerant of, high suspended sediment concentrations, the effects of turbidity and suspended solids on fisheries in the area would likely be negligible.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.4.5 Threatened and Endangered Species

Endangered species consultation with USFWS and NMFS is ongoing at the time of Draft release and no conclusions have been made at the time of this draft release. Preliminary MVN findings are discussed in this section. Once finalized, annual dredging operations would continue to be coordinated with the USFWS and NMFS on at least an annual basis under the Endangered Species Act. Opportunities to avoid impacts to protected species were presented previously in the Fish and Wildlife Conservation Recommendations in Section 4.4.3 (Appendix 8).

Alternative 3

Direct and Indirect Impacts: The deepening of the crossings and the lower river, and the disposal of associated dredge materials would not adversely affect any designated critical habitats for

protected species, and the project is not likely to adversely affect threatened or endangered species.

High levels of sediment in the water column and low prey availability probably preclude any high concentrations of sea turtles in the proposed dredging regions. Sea turtles have the mobility necessary (i.e. physiology, suitable habitat elsewhere) to avoid the project area during periods of dredging. Furthermore, hydraulic cutterhead pipeline dredging operations have not been identified as a source of sea turtle mortality.

It is extremely unlikely that manatees would be found in the project area or the surrounding shallow open waters; however, if manatees are observed within 100 yards of the "active work zone" during proposed dredging/disposal activities, MVN would implement the appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. The following special operating conditions for manatees would be included in any MVN plans and specifications developed prior to dredging and disposal activities, as recommended by the USFWS, Lafayette, Louisiana Field Office:

The West Indian manatee may be present in the project vicinity. The Contractor shall instruct all personnel associated with the project of the potential presence of manatees in the area, and the need to avoid collisions with these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees. Manatees are protected under the Marine Mammal Protection Act of 1972, and the Endangered Species Act of 1973. The Contractor shall be held responsible for any manatee harmed, harassed, or killed as a result of construction activities not conducted in accordance with these Specifications:

> Manatee Signs. Prior to commencement of construction, each vessel involved in construction activities shall display at the vessel control station or in a prominent location, visible to all employees operating the vessel, a temporary sign at least 8-1/2" x 11" reading, "CAUTION: MANATEE HABITAT/IDLE SPEED IS REQUIRED IN CONSTRUCTION AREA." In the absence of a vessel, a temporary 3' x 4' sign reading "CAUTION: MANATEE AREA" shall be posted adjacent to the issued construction permit. A second temporary sign measuring 8-1/2" x 11" reading "CAUTION: MANATEE HABITAT. EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION" shall be posted at the dredge operator control station and at a location prominently adjacent to the issued construction permit.
>
> The Contractor shall remove the signs upon completion of construction.

a. Special Operating Conditions if Manatees are Present in the Project Area.

(1) If a manatee(s) is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the Contractor to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee is closer than 50 feet to moving equipment or the project area, the equipment shall be shut down and all construction activities shall cease to ensure protection of the manatee. Construction activities shall not resume until the manatee has departed and the 50-foot buffer has been reestablished.

(2) If a manatee(s) is sighted in the project area, all vessels associated with the project shall operate at "no wake/idle" speeds at all times, and vessels will follow routes of deep water whenever possible, until the manatee has departed the project area. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category, where navigational safety permits.

(3) If siltation barriers are used, they shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment

Piping plovers and the Red Knot could occur along the shoreline and in the intertidal and shallow waters of the project area during winter migration, but are not permanent residents of the area. During placement of dredged material into the proposed disposal areas, piping plovers may be temporarily displaced to other areas for foraging and loafing; however, this is not considered to be detrimental due to an abundance of similar habitat in the vicinity of the project area.

The Gulf sturgeon is not anticipated to be present at the reach of the crossings. Pallid sturgeon are believed to be a strictly freshwater fish rarely found downstream of New Orleans, LA. Both sturgeon are probably absent from the Mississippi River delta during low river flows when salt water from the Gulf of Mexico intrudes upriver along the bottom of the channel (salt water wedge). If project construction is planned during these events, impacts to pallid sturgeon due to dredging activities in the Mississippi River Delta are unlikely. Pallid sturgeon, however, are potentially affected by crossing construction and maintenance

The USFWS recently provided the following recommendations for MVN to implement during annual maintenance dredging activities. Their implementation should further reduce the unlikely chance of encountering pallid sturgeons, turtles or other fish species while conducting dredging activities.

1. To the extent possible, schedule dredging activities in the project area during low flow periods, when salt water occurs on the channel bottom further upriver than during normal or high river flows.

2. The cutterhead should remain completely buried in the bottom material during dredging operations. If pumping water through the cutterhead is necessary to dislodge material or to clean the pumps or cutterhead, etc., the pumping rate should be reduced to the lowest rate possible until the cutterhead is at mid-depth, where the pumping rate can then be increased.

3. During dredging, the pumping rates should be reduced to the slowest speed feasible while the cutterhead is descending to the channel bottom.

4. If hopper dredges are utilized, explore the feasibility of using a rigid sea turtle deflector, which is designed to protect sea turtles by preventing them from entering the draghead, and evaluate the effectiveness of that device for pallid sturgeon and other fish species.

Alternative 2

Direct and Indirect Impacts: Impacts to sea turtles, piping plover, and the red knot would not be expected with Alternative 2 due to the location of river work and because cutterhead dredges would not be utilized. All other impacts to threatened and endangered species are similar to Alternative 3 and were previously described.

Alternative 3d

See *Direct and Indirect Impacts* section for Alternative 3.

4.5 Cumulative Impacts

Past, Present, and Foreseeable Coastal Restoration Actions in Louisiana:

The list below describes coastal ecosystem restoration efforts that cumulatively effect coastal wetland loss within the region. The EPA, reporting on the Nation, states the number of restoration projects grows yearly. Current Federal initiatives call for a wide range of restoration actions, including improving or restoring 25,000 miles of stream corridor; which contributes to the success of neo-tropical migratory species

(sources: http://www.nwd-mr.usace.army.mil/rcc/MRFTF/docs/USACE-NFPC%20Nonstructural%20Measures%20Definitions.pdf; and http://water.epa.gov/type/wetlands/restore/principles.cfm).

- Coastal Impact Assistance Program (CIAP) is authorized by the Outer Continental Shelf (OCS) Lands Act, as amended; 31 U.S.C. 6301-6305. The intent of the program is to disburse funding to eligible producing states and coastal political subdivisions for the purpose of conservation, protection, or restoration of coastal areas including wetlands; mitigation of damage to fish, wildlife, or natural resources; planning assistance and the administrative costs of complying with these objectives; implementation of a federally-approved marine, coastal, or comprehensive conservation management plan; and mitigation of the impact of outer Continental Shelf activities through funding of onshore infrastructure projects and public service needs. Louisiana's CIAP Program, administered by the Department of Interior, provides approximately $500 million dollars to Louisiana and includes a total of 103 projects state-wide, with 11 state projects, 17 state/parish projects and 75 parish projects. Examples of CIAP projects are presented below.
    - East Grand Terre Island Barrier Island Restoration
    - Barataria Land Bridge Dedicated Dredging created more than 2,000 acres of marsh
    - Currently under construction is the Marcantel Beneficial Use to create 440 acres of marsh
    - PO-73-2 - Central Wetlands – EBSTP to A2
    - PO-148 - Living Shoreline
    - TE-63 - Falgout Canal Freshwater Enhancement
    - BA-0161 - Mississippi River Water Reintroduction into Bayou Lafourche
- CWPPRA Program – In 1990, Congress passed the Breaux Act (Public Law 101-646, Title III CWPPRA); it is authorized until 2019. As of June 2016, 210 CWPPRA projects have been approved, 102 have been constructed, 23 are under construction, 23 are in the engineering & design phase, 5 are Program support projects & 57 have been deauthorized, inactivated or transferred to another program. (There are 153 active CWPPRA projects refer to the following website for a comprehensive list: https://lacoast.gov/new/Projects/List.aspx).
- CS-Louisiana Coastal Area (LCA), Ecosystem Restoration Study (USACE 2004) recommends 15 near-term measures aimed at addressing the critical restoration needs. The components recommended for authorization include five critical near-term ecosystem restoration measures, a demonstration program consisting of a series of demonstration projects, a beneficial use of dredged material (BUDMAT) program, and a science and technology program. The five

critical near-term ecosystem restoration measures, demonstration projects, and BUDMAT projects are all subject to the approval of feasibility level of detail decision documents by the Secretary of the Army. To date, a total of 80 acres of wetlands were created by placing HDDA dredged material in shallow open water areas of West Bay under the LCA BUDMAT program in FY 2015. At least for some unidentified period of time, LCA BUDMAT will potentially utilize dredge material from this project beneficially beyond the Federal Standard. Presently the LCA BUDMAT authorization is limited to federal expenditure of $100,000,000. The 2012 State Master Plan indicates little opportunity in partnering on beneficial use south of Venice, LA. The January 31, 2005, Chief's Report approved the Near-Term Plan substantially in accordance with the 2004 LCA Study. Title VII of the Water Resources Development Act of 2007 (WRDA 2007) (Public Law 110-114) authorized an ecosystem restoration Program for the Louisiana Coastal Area substantially in accordance with the Near-Term Plan. Some of the LCA projects have not yet been authorized for construction, and some of those that have been authorized for construction but no longer have a local non-federal sponsor. Except for BUDMAT, portions of the following projects are being constructed by the State pursuant to an In-Kind MOU. Some portion of these projects were constructed without an agreement or In-Kind MOU in place and are thus not eligible for credit as a LCA project. None of the construction efforts by the State have been determined officially to be integral to the Federal LCA project. That will not occur until the Integral Determination Report process is commenced. Except for BUDMAT, these are being constructed independently by the state and that portions of the projects have the potential to be approved as integral to the LCA project.

- LCA projects that are completed or are currently under construction include:
- LCA BUDMAT at Tiger Pass (not yet constructed)
- LCA West Bay Marsh Creation Tier 1 project, which is part of the LCA's Beneficial Use of Dredged Material (BUDMAT) Program
- LCA Barataria Basin Barrier Shoreline Caminada (Phase II)
- LCA Barataria Basin Barrier Shoreline Shell Island (Phase II)
- A portion of the LCA Terrebonne Basin Barrier Shoreline Whiskey Island
- LCA Amite Diversion Canal modification

- The 2012 Louisiana's Comprehensive Master Plan for a Sustainable Coast, (source: http://issuu.com/coastalmasterplan/docs/coastal_master_plan-v2?e=3722998/2447530; indicates that the CPRAB has, since 2007:
    - Benefited 19,405 acres of coastal habitat
    - Moved over 150 projects into design and construction
    - Constructed projects in 20 parishes
    - Constructed 32 miles of barrier islands/berms
- USACE Navigation projects, Beneficial Use of Dredged Material Program

1. The CEMVN maintains 11 major navigational channels in LA. (2800 miles of waterways) On average, about 74.4 million cubic yards (CY) of shoal material are removed from Federal navigation channels every year.

    a. of this annual total, about 18.7 million CY is removed from projects located too far from potential beneficial use disposal sites to be economically feasible
        - the Mississippi River Deep Draft Crossings account for about 18 million CY of this total

    b. of this annual total, about 16.3 million CY consists of "fluff" material that is not usable/suitable for marsh restoration
        - the Atchafalaya River and Calcasieu River bar channels account for this "fluff" material

2. Thus, of the 74.4 million CY that the CEMVN dredges every year, only about 39.4 million CY are actually available for beneficial use placement.

3. On average, about 16.4 million CY of dredged material is beneficially used on an annual basis.

    a. This equals about 42 % of all dredged material removed annually in CEMVN that is actually available and suitable for beneficial use placement.

    b. The majority of this beneficial use is funded by the O&M budget. The remainder is paid for by CWPPRA, Section 204, or by Contributed Funds depending on availability.

4. With the exception of the Gulf Intracoastal Waterway, all major Federal navigation channels where maintenance dredging is performed have had some portion of their dredged material used beneficially.

5. Shoal material removed by hopper dredges in Southwest Pass (about 13-14 million CY annually) are not currently used directly for beneficial uses. However, the hopper dredge disposal area located at Head of Passes is occasionally dredged by cutterhead dredge and this material is beneficially used to create marsh and duck nesting habitat on the nearby Delta National Wildlife Refuge.

6. Since 1976, some portion of sediments removed from Federal navigation channels in Louisiana have been used for coastal habitat restoration.

a. Dredged material from Southwest Pass provided the sediment source for this initial beneficial use effort in 1976.

7. To date (1976-2015), the CEMVN has used dredged material to create/restore approximately 62 square miles (39,568 acres) of coastal habitat in Louisiana. The majority of this beneficial use is funded by the O&M budget under the Federal Standard. Anything beneficial use beyond the Federal Standard would require funding from other programs such as CWPPRA, LCA BUDMAT, Continuing Authorities Program - Section 204, or by Contributed Funds depending on availability.

a. Approximately 33,083 acres of wetland habitat.

b. Approximately 3,485 acres of bird nesting islands, beach/shoreline, and barrier island habitat.

c. Approximately 3,000 acres of scrub/shrub, maritime forest ridge, grassland habitat (Southwest Pass).

8. Channel-by-channel breakdown of beneficial acres created/restored by Federal navigation projects:

a. Calcasieu River = 3,358 acres
b. Mermentau River = 242 acres
c. Freshwater Bayou = 344 acres
d. Atchafalaya River = 8,986
e. Houma Navigation Canal = 143 acres
f. Port Fourchon = 309 acres
g. Barataria Bay Waterway = 1,079 acres
h. Tiger Pass = 624 acres

i. Baptiste Collette = 1,828
j. South Pass = 1,971 acres
k. Southwest Pass = 18,013 acres
l. MRGO = 2,591
m. Berwick Bay Harbor = 59
n. Tangipahoa River = 21

- Restoration of injuries to natural resources damaged by the 2010 Deepwater Horizon oil spill is presently under the Natural Resource Damage Assessment (NRDA), a legal process under the Oil Pollution Act of 1990 (OPA) and the Louisiana Oil Spill Prevention and Response Act of 1991 (LOSPRA) whereby designated trustees represent the public to ensure that natural resources injured in an oil spill are restored (source: http://la-dwh.com/AboutNRDA.aspx; accessed November 25, 2015). Both federal and state NRDA regulations provide a step-by-step process for trustees to determine injuries, to assess damages, and to develop and implement restoration projects that compensate the public for injuries to natural resources impacted by an incident. In general, the NRDA process involves three steps: (1) pre-assessment; (2) restoration planning; and (3) restoration implementation. On July 11, 2011, Governor Bobby Jindal unveiled the "Louisiana Plan" which outlines 13 initial proposed early restoration projects (source: http://la-dwh.com/LouisianaPlanProjects.aspx). The projects are consistent with Louisiana's Coastal Master Plan and they support the goal of compensating the public for natural resource injuries resulting from the Deepwater Horizon Oil Spill.

- In February of 2015, the Deepwater Horizon Natural Resource Damage Assessment Trustees finalized the Deepwater Horizon Oil Spill Draft Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS) for public review and comment (source: http://la-dwh.com/PDARP_PEIS/Draft_PDARP_PEIS.aspx). The Trustees identified Alternative A as their preferred alternative. Alternative A is an integrated restoration portfolio that emphasizes the broad ecosystem benefits that can be realized through coastal habitat restoration in combination with resource-specific restoration in the ecologically interconnected northern Gulf of Mexico ecosystem. The restoration dollars could be used for a variety of restoration approaches. For illustration purposes only, the approximately $4 billion allocated to Louisiana could be sufficient to create 20,000 to 40,000 acres of coastal marsh in Louisiana along hundreds of miles of shoreline, supporting the diversity of fish, birds, and animals that depend on coastal marsh. Although no NRDA sponsored projects have yet been constructed, it is reasonably foreseeable that the nearly Gulf-coast wide damages would be mitigated.

- The Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act) represents a portion of the Congressional

response to the Deepwater Horizon oil spill. The Act dedicates 80 percent of all Clean Water Act administrative and civil penalties related to the Deepwater Horizon oil spill to the Gulf Coast Restoration Trust Fund (Trust Fund). RESTORE Act funds are allocated between five buckets: the Direct Component (35%), the Council-Selected Restoration Component (30%), the Spill Impact Component (30%), the Gulf Coast Ecosystem Restoration Science Program (2.5%); and Centers of Excellence Research Grants Program (2.5%). In early 2013, Transocean entered into a plea agreement to pay $1 billion to resolve federal Clean Water Act civil penalty claims, of which $800 million will be made available under the RESTORE Act to fund Gulf Coast recovery projects. The process of selecting projects for implementation under the RESTORE Act is anticipated to continue through the period of analysis, until the allocated funds are exhausted. Some projects have been selected and funded for implementation and will be discussed as a part of the reasonably foreseeable actions section below. In November of 2016, the Louisiana Coastal Protection and Restoration Authority (CPRA) has been awarded two grants totaling approximately $7.5 million from the Gulf Coast Ecosystem Restoration Council (RESTORE Council) for engineering and design of the Golden Triangle Marsh Creation ($3.2M) project and the Biloxi Marsh Living Shoreline ($4.3M) project under the Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act). These projects represent two out of seven total projects that were selected for funding by the RESTORE Council under its Initial Funded Priorities List that will directly benefit Louisiana. One additional grant in the amount of $7.3 million was funded by the RESTORE Council in September for the engineering and design of the West Grand Terre Beach Nourishment and Stabilization Project.

Past, Present and Foreseeable Actions Along the Project Corridor (Baton Rouge, LA to the Gulf of Mexico:

The impact of past, present, and reasonably foreseeable projects in the project area on the important resources documented in this SEIS are represented by Table 4-2. Ecosystem restoration type projects in the basin work to enhance and restore historic ecosystem processes within the basin. Although these projects may result in temporal impacts and tradeoffs within the important resources, their overall effects on the system from a human and natural environmental perspective would be wholly positive. The structural projects (e.g. levee systems), to a large degree, produce socioeconomic benefits (primarily in the form of navigation or flood control) that are the impetus for their construction. Though impacts to the natural environment from construction of these projects have been avoided to the maximum extent practicable, remaining unavoidable impacts would require mitigation. Environmental Justice impacts have been avoided during design of these projects. However, the structural projects have resulted in impacts to the aesthetics and recreational

opportunities within the system. Ecosystem restoration plans in the region that improve estuarine habitat also provide benefits to the commercial fishing industry.

The list is not exhaustive, but provides a representative sample of projects that cumulatively effect the river corridor and coastal wetland loss.

Table 4-2 Cumulative impacts of past present and reasonably foreseeable projects along the project corridor between Baton Rouge, LA and the Gulf of Mexico ("+" =positive, "-" =equals negative and "O" = no impact)

Project Name	Project Type	Wetlands and Other Surface Waters	Wildlife	Threatened and Endangered Species	Fisheries, Aquatic Resources, and Water	Essential Fish Habitat	Cultural Resources	Recreational Resources	Aesthetic Resources	Air Quality	Noise	Socioeconomics
CIAP BA-43 (EB): EB-Long Distance Mississippi River Sediment Pipeline	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
CWPPRA BA-39: Mississippi River Sediment Delivery System - Bayou Dupont	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
State of Louisiana BA-03: Naomi Siphon Diversion	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
WRDA BA-01: Davis Pond Freshwater Diversion and Forced Drainage Area	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
Louisiana DOTD: Future I-49 Corridor	Structure	+/-	+/-	o	o	-	O	-	-	o	+	+
US Army Corps of Engineers: Davis Pond	Structure	+/-	+/-	o	o	o	O	-	-	o	o	o

Project Name	Project Type	Wetlands and Other Surface Waters	Wildlife	Threatened and Endangered Species	Fisheries, Aquatic Resources, and Water	Essential Fish Habitat	Cultural Resources	Recreational Resources	Aesthetic Resources	Air Quality	Noise	Socioeconomics
Freshwater Diversion Structure												
Algiers Lock	Structure	+/-	+/-	o	-	-	O	+/-	-	o	o	-
Local Drainage Improvements												
Small Diversion at Convent/Blind River	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
Venice Ponds Marsh Creation and Crevasses	Structure	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
Empire Lock	Structure	+/-	+/-	o	-	-	O	+/-	-	o	o	-
WestBay Sediment Diversion	Diversion	+	+/-	o	+/-	+/-	O	+/-	o	o	o	o
GIWW Navigation System	Structure	+/-	+/-	o	+/-	+/-	+/-	+/-	o	o	o	+
Harvey Canal Lock	Structure	+/-	+/-	o	-	-	O	+/-	-	o	o	-
Greater New Orleans Hurricane & Storm Damage Risk Reduction System	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+
Mississippi River Levees : MR&T Project	Structure	+/-	+/-	o	-	-	+/-	-	-	o	o	+
Mississippi River Navigation Operations and Maintenance	Structure	+/-	+/-	o	+/-	+/-	O	-	o	o	o	+
New Orleans to Venice (NOV) levee project, Incorporation	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+

Project Name	Project Type	Wetlands and Other Surface Waters	Wildlife	Threatened and Endangered Species	Fisheries, Aquatic Resources, and Water	Essential Fish Habitat	Cultural Resources	Recreational Resources	Aesthetic Resources	Air Quality	Noise	Socioeconomics
of Non-federal Levees (NFL) into NOV												
New Orleans to Venice (NOV) levee project, St. Jude to Venice	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+
Oakville to La Reussite Non-federal Levee	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+
Bonnet Carré Spillway	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+
Commercial and Industrial Developments (Expansion of chemical plants and port facilities)	Structure	+/-	+/-	o	o	o	O	-	-	o	o	+

Cumulative Impacts of the Alternatives

The cumulative impacts of dredging of each alternative are quantified in table 4-3.

Table 4-3 Cumulative Impacts from dredging (No action + incremental impacts of each alternative over 50 years)

	Crossings Construction	Lower River Construction	Annual O&M Crossings	Annual O&M Lower River	Total Construction Dredging	Total Maintenance Dredging	Total Dredged Construction + Maintenance over 50 years	Acres created
Alt. 1	0	0	13,069,498	22,250,000	0.00	653,474,900.00	653,474,900.00	26,400
Alt. 2	5,467,000	0	38,397,000	22,250,000	5,467,000.00	1,919,850,000.00	1,925,317,000.00	26,400
Alt. 3	8,588,600	19,900,000	48,377,000	22,250,000	28,488,600.00	3,413,850,000.00	3,442,338,600.00	27,862.5
Alt 3d	616,600	19,900,000	18,156,498	22,250,000	20,516,600.00	1,902,824,900.00	1,923,341,500.00	27,862.5

Alternative 3

The cumulative impacts of building and maintaining the river crossings over 50 years are not anticipated to be significant based on 1D modeling results. As the sediment would remain within the river system, cumulative impacts on natural resources are expected to be minimal due to the already turbid nature of the river. Increasing the depth of the river is not anticipated to necessitate construction of additional saltwater mitigation features in the lower river. Increased saltwater intrusion events would simply require implementation of the mitigation system more frequently. However, there are provisions to increase capacity of the system with 25% to 50% growth, 50% to 75% growth and again at 75% to 100% growth in population.

By constructing and maintaining Alternative 3, approximately 3,442,338,600.00 cy of material would be dredged during the 50-year project life. Based on land loss between 1932 and 2010 (Couvillon 2012), the disposal area is projected to continue to lose approximately 57 percent of existing land within the entire disposal area long term plan. Beneficial use of dredged material would establish 365.6 acres annually during the 4 year construction of the lower river. An additional 528 acres of intermediate marsh is anticipated to be established annually as part of the project, but under the no action alternative. The amount of material dredged during construction of the Southwest Pass from 48 ft to 50 ft would be less than the amount of material dredged during typical annual maintenance, and Southwest Pass would not require additional (i.e., incremental) maintenance dredging after construction according to the 1D model (Appendix C)..

During construction, the beneficial use of dredged material into open water habitat would result in approximately 576.5 AAHUs of intermediate marsh (with a final target elevation of 2 feet or less, Appendix A-7). Due to high rates of land loss in the area, approximately 1,082 acres are expected to remain after 50 years. Cumulatively, an additional approximately 26,921 23,209 acres (6161 AAHUs) of intermediate marsh habitat is anticipated to be constructed and remain via beneficial use over the 50-year project life (as part of the no-action alternative). Due to high rates of land loss in the area, less than 11,576 acres are expected to remain after 50 years. Upon public review and agency coordination, a final estimate at year 50 will be provided in the final report.

Eustatic sea level rise and channel deepening/enlargement would continue to shift deposition (and therefore dredging) upstream towards Venice, LA, over time. However, 1D model results indicate an increase in net dredging in the lower river is not expected.

Overall, the cumulative impacts of the proposed action on the natural environment are expected to be positive, with long-term benefits to navigation, wetlands, EFH, fisheries, and wildlife resources, and recreational opportunities anticipated in the project area. The switching of EFH types from

construction of the proposed project would not be expected to have a significant impact to the overall EFH in the delta basin. Impacts to cover and foraging for managed species are not anticipated to contribute significant increases in cumulative impacts to managed species as the borrow areas are small in size compared to the available EFH habitat in the basin.

The project would be cumulatively beneficial in the form of additional cover, resting, nesting and foraging habitat for wildlife species. Water quality and benthic species would still be expected to rebound once project construction is complete. The restoration of fresh marsh in areas that are currently open water would provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus thereby increasing the primary productivity in the wetland system.

With a phased construction approach, cumulative impacts to the air quality would be relatively minor, and the status of attainment would not noticeably change from current conditions or those in the foreseeable future. Long-term, cumulative impacts are not anticipated as it relates to surface water quality. The cumulative noise impacts would principally be related to the potential short-term disruption of fish and wildlife species and similar impacts by other similar Federal, state, local, and private restoration activities as well as other human-induced noise disruptions to these organisms.

Short-term disturbances due to dredging activities such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments would likely have a short duration before returning to pre-dredging conditions. Impacts to localized fisheries would be expected to be temporary and minimal because the river system is a highly turbid system.

The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are final. Because MVN dredges and places material back into the channel at the crossings, crossing construction and maintenance is not likely to have cumulative impacts on existing diversions. Deepening Southwest Pass may have an effect on frequency and duration of saltwater wedge migration that threaten drinking water supplies upriver, however, modeling results are still ongoing. Regardless of results, it is anticipated that appropriate mitigation measures identified in Chapter 2 would be taken to avoid such impacts should they occur.

There are no distinct cumulative impacts to cultural resources within the channel crossings, because any unidentified cultural resources that may exist at the increased depths of dredging would be adversely affected or destroyed at the first instance of dredging. Within the expanded disposal areas (should they be determined to be necessary for the implementation of a

recommended plan), the migration of sediments from one location to another by natural processes within the disposal areas, could cumulatively lead to erosion of any unidentified historic property by physical force of moving sediment, or could gradually bury any historic property.

Overall, the cumulative impacts of the proposed action in addition to other planned and ongoing federal and state civil works projects are expected to be positive, with long-term benefits to recreational opportunities anticipated in the project area. Much of the impacts on recreation, however minimal, would be temporary. Disposal projects, in general, tend to have positive long term impacts on recreational opportunities as they, over time, provide nesting habitat for water fowl and nursery habitat for fish.

It is anticipated that the beneficial use of dredged material would not result in negative cumulative impacts to soils or water bottoms in or near the project area. Cumulative impacts to soils and water bottoms would be offset by the creation of marsh, bird islands, deltaic ridges, and other aquatic habitat types that would ultimately provide valuable coastal habitat and improve storm surge attenuation capacity in the Mississippi River Delta. Impacts associated with potential utility relocations are not anticipated to be significant once fully investigated.

There are no foreseen cumulative impacts to visual resources in the study area. Cumulative impacts would be the incremental direct and indirect impacts of implementing the proposed action combined with the continued activities of growth and development in the area. Continued relative sea level rise could also impact the entire area resulting in vast areas of shallow open water as vertical accretion rates fail to keep pace with rising sea levels. Impacts to visual resources would continue throughout not only the project area but also coastal Louisiana and the Nation due to the loss of wetlands and conversion of existing habitats to open water habitats. However, wetland restoration efforts such as the CWPPRA, CIAP, and LCA Programs could restore partially the land, would convert existing view sheds of open water into marsh, wetland, swamp or a variety of landscape types that frame large bodies of open water and use the basic design elements of form, line, texture, color and repetition to create an aesthetically pleasing view shed.

The cumulative impacts of the project, when added to other past, present, and reasonably foreseeable ecosystem restoration, mitigation or other type projects in the basin would minimally and temporarily affect socio-economic resources. Due to the remote and generally unpopulated areas where the projects would be constructed and the temporary nature of the project construction activities, the proposed modifications would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the region and would not contribute significantly to cumulative impacts to socio-economic resources in the basin. The project's creation of additional marsh and upland acres offers incremental protection from

hurricane and storm damage, thereby helping to safeguard lives and property in Plaquemines Parish.

Wetland loss could threaten public facilities and increase maintenance costs. In areas with high projected population growth rates, the need for public services could increase. Temporary and permanent relocation of residents due to damage from weather events would have a negative impact on community cohesion. In addition, community cohesion would be adversely affected if residents and business chose to relocate to areas with lower risk.

Construction would temporarily disrupt transportation, navigation, and commercial fishing in project areas, however, these impacts would continue to be minor and temporary during the period of construction when compared to the previous design. Land use impacts, such as impacts to commercial/industrial properties and public facilities, are not anticipated as the projects are typically located in unpopulated areas.

It is anticipated that through the efforts taken to avoid wetlands impacts and the beneficial use of dredged material that functionally compensates unavoidable remaining impacts, the proposed project would not result in overall adverse cumulative impacts to the aquatic environment and human environment in or near the project area.

Alternative 2

The cumulative impacts of building and maintaining the river crossings over 50 years are not anticipated to be significant based on 1D modeling results. As the sediment would remain within the river system, cumulative impacts on natural resources are expected to be minimal due to the already turbid nature of the river.

By constructing and maintaining Alternative 2, approximately 1,925,317,000.00 cy of material would be dredged during the 50-year project life. No additional (i.e., incremental) marsh creation would occur under Alternative 2 because O&M would not increase, however, an additional 528 acres of intermediate marsh is anticipated to be established annually as part of the project under the no action alternative. Cumulatively, approximately 23,209 acres (6161 AAHUs) of intermediate marsh habitat is anticipated to remain via beneficial use over the 50-year period of analysis (as part of the no-action alternative, Appendix A-7). Because CEMVN dredges and places material back into the channel, crossing construction and maintenance is not likely to have a cumulative impact on water levels, sediment transport, or existing diversions.

Short-term disturbances due to dredging activities such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments would likely have a short duration

before returning to pre-dredging conditions. Impacts to localized fisheries is expected to be temporary and minimal because the river system is a highly turbid system. The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are available. Because MVN dredges and places material back into the channel at the crossings, crossing construction and maintenance is not likely to have add to cumulative impacts on diversions.

The cumulative impacts of the project, when added to other past, present, and reasonably foreseeable ecosystem restoration, mitigation or other type projects in the basin would minimally and temporarily affect socio-economic resources. Due to the remote and generally unpopulated areas where the projects would be constructed and the temporary nature of the project construction activities, the proposed modifications would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the region and would not contribute significantly to cumulative impacts to socio-economic resources in the basin. Wetland loss could threaten public facilities and increase maintenance costs. In areas with high projected population growth rates, the need for public services could increase. Temporary and permanent relocation of residents due to damage from weather events would have a negative impact on community cohesion. In addition, community cohesion would be adversely affected if residents and business chose to relocate to areas with lower risk. Economic activity related to shipping would be held back by low water depth (48 ft MLLW) along the river. Economic activity related to wetland resources would be adversely affected by the depletion of these resources along the coastline. Industry development would contribute to the degradation of wetlands. Businesses may relocate to areas with less risk of storm damage.

Eustatic (i.e., global) sea level rise, and a reduction in river flows due to upstream diversions would continue to shift deposition (and therefore dredging) upstream towards Venice, La over time. However, 1D model results indicate an increase in net dredging in the lower river is not expected.

The cumulative noise impacts would principally be related to the potential short-term disruption of fish and wildlife species as well as other human-induced noise disruptions to these organisms. With a phased construction approach, impacts to the air quality would be relatively minor, and the status of attainment would not noticeably change from current conditions or those in the foreseeable future. Long-term, cumulative impacts are not anticipated as it relates to surface water quality. Near-term disturbances due to dredging activities such as increased turbidity and potential suspension of contaminants that may exist in the bed sediments would likely have a short duration before returning to pre-dredging conditions. The dredging elutriates previously described will be incorporated into this analysis and evaluated for any potential long-term impacts to drinking water supplies once the data are available. There are no distinct cumulative impacts to cultural resources

within the channel crossings, because any unidentified cultural resources that may exist at the increased depths of dredging would be adversely affected or destroyed at the first instance of dredging.

Overall, the cumulative impacts of the proposed action on recreation, in addition to other planned and ongoing federal and state civil works projects, are expected to be negligible. It is anticipated that the beneficial use of dredged material within the Federal Standard would not result in negative cumulative impacts to soils or water bottoms in or near the project area. Cumulative impacts associated with potential utility relocations are not anticipated to be significant once fully investigated.

There are no foreseen cumulative impacts to visual resources in the study area. Cumulative impacts would be the incremental direct and indirect impacts of implementing the proposed action combined with the continued activities of growth and development in the area. Continued relative sea level rise could also impact the entire area resulting in vast areas of shallow open water as vertical accretion rates fail to keep pace with rising sea levels. Impacts to visual resources would continue throughout not only the project area but also coastal Louisiana and the Nation due to the loss of wetlands and conversion of existing habitats to open water habitats. However, wetland restoration efforts such as the CWPPRA (potentially deauthorized in 2019) and CIAP Programs could restore partially the land, would convert existing view sheds of open water into marsh, wetland, swamp or a variety of landscape types that frame large bodies of open water and use the basic design elements of form, line, texture, color and repetition to create an aesthetically pleasing view shed.

There are no distinct cumulative impacts to cultural resources within the channel crossings, because any unidentified cultural resources that may exist at the increased depths of dredging would be adversely affected or destroyed at the first instance of dredging. Within the expanded disposal areas (should they be determined to be necessary for the implementation of a recommended plan), the migration of sediments from one location to another by natural processes within the disposal areas, could cumulatively lead to erosion of any unidentified historic property by physical force of moving sediment, or could gradually bury any historic property.

Construction would temporarily disrupt transportation, navigation and commercial fishing in project areas, however, these impacts would continue to be minor and temporary during the period of construction when compared to the previous design. Land use impacts, such as impacts to commercial/industrial properties and public facilities, are not anticipated as the projects are typically located in unpopulated areas.

It is anticipated that the proposed project would not result in overall adverse cumulative impact to the aquatic environment and human environment in or near the project area.

Alternative 3d

See Cumulative Impacts section for Alternative 3. The cumulative impacts from work in the lower river are the same as those reported for Alternative 3. The construction of the 3 crossings would require 616,000 cy of dredging and the average annual O&M of those crossings would require 18,156,498 cy of dredging. Over a 50-year period, 1,923,341,500 cy of material would be dredged from the crossings and from the lower river under Alternative 3d. Significant impacts to important resources are not expected under Alternative 3d. Due to the nature of the beneficial use of dredged material, subject to the limit of the Federal Standard, the cumulative impacts of Alternative 3d are anticipated to have a net positive environmental impact.

4.6 Mitigation Requirements Associated With the TSP

The TSP (Alternative 3d) would result in the discharge of fill material into waters of the U.S. Under authority delegated from the Secretary of the Army and in accordance with Section 404 of the Clean Water Act of 1977, the USACE regulates discharges of dredged or fill material into waters (e.g., wetlands) of the U.S. Although the USACE does not process and issue permits for its own activities, the USACE authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements, including public hearings and application of the section 404(b)(1) guidelines. An evaluation of the open water beneficial use-disposal site will be prepared by MVN prior to signing a Record of Decision. Signing of the 404(b)(1) evaluation by the District Commander would finalize documentation of compliance with the Section 404(b)(1) guidelines for the proposed actions addressed in this SEIS (Appendices A-9, A-10, A-11).

Construction related impacts are generally temporary and localized and include: increased turbidity and total suspended sediments, organic enrichment, chemical leaching, reduced dissolved oxygen, and elevated carbon dioxide levels. Following construction, these temporary and localized effects would return to pre-construction levels. There are no significant long-term adverse cumulative effects expected from construction.

Implementation of the proposed action in some situations may require some unavoidable (i.e., incidental), very minor impacts to wetland resources during the preparation for the placement of beneficial use of dredged material. A small, undetermined amount of wetland habitat may be temporarily impacted during pipeline placement and access to the open water proposed disposal areas. However, these minor, incidental impacts are unavoidable, would be temporary, and would result in coastal marsh creation. As such, project related impacts would not require mitigation for

the minor, incidental impacts to wetlands that are necessary for wetland creation. Approximately 146.3 acres of SAV habitat would be converted to intermediate marsh as a result of project construction, and although coordination with NMFS and USFWS is ongoing, this habitat conversion is anticipated to have a net beneficial impact on local aquatic resources and fisheries. It is anticipated that through the efforts taken to avoid wetlands impacts and the beneficial use of dredged material that functionally compensates for the minor, unavoidable remaining impacts incidental to beneficial use, the proposed project would have a net beneficial environmental impact, and would not result in overall adverse direct, secondary, or cumulative impacts to the aquatic environment in or near the project area.

As is current practice, measures to avoid and minimize impacts to significant resources would be employed to the extent practicable. During construction, the beneficial use of dredged material, subject to the limitations of the Federal Standard into open water habitat will result in approximately 1462.5 acres of intermediate marsh (and a net of 1082 acres and 576.5 AAHUs). Due to high rates of land loss in the area, 1082 acres of created marsh would be expected to remain 50 years after construction Appendix A-7).